

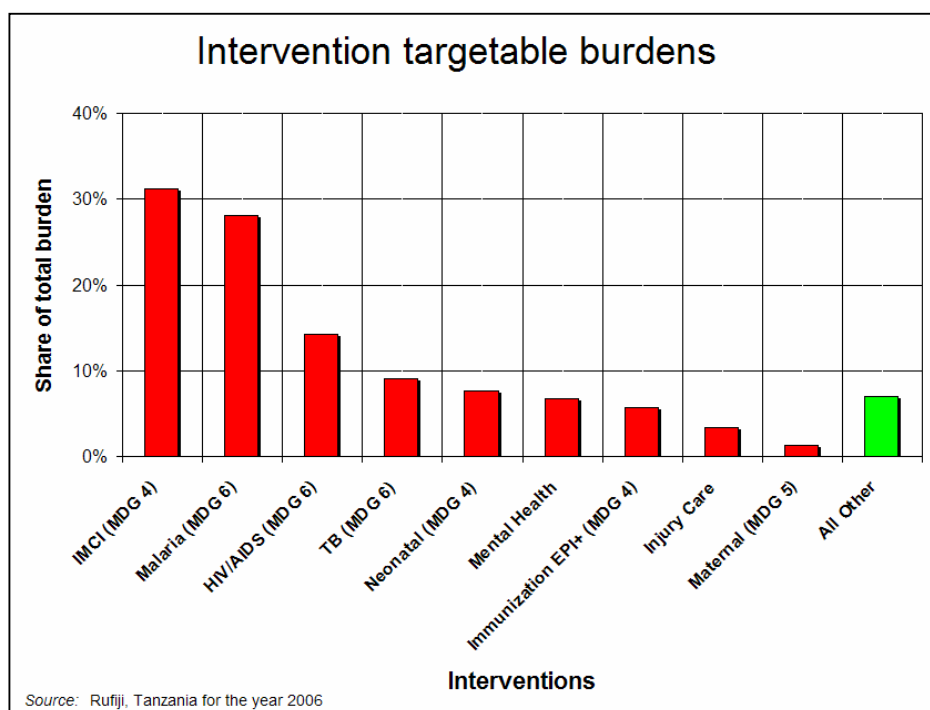
Tanzania



Ministry of Health and Social Welfare

DISTRICT HEALTH PROFILE 2007

A Chart Book of Selected Health and Demographic indicators



*Health Information for Council Health Management Teams
2006-2007 District Health Year and 2008 Planning Cycle*

*- For Tanzanian Rural Coastal Districts -
Lindi, Mtwara, Pwani and Tanga Regions*

Based on the Coastal Sentinel Demographic Surveillance System

Data Source: Coastal Sentinel Demographic Surveillance System data from 2006
Tanzania Ministry of Health and Social Welfare, HMIS National Sentinel Surveillance System (NSS)
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DISTRICT HEALTH PROFILE - 2007

RURAL COASTAL DISTRICTS

Coastal Sentinel District Information for Rural Districts of Lindi, Mtwara, Pwani and Tanga Regions

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DISTRICT HEALTH PROFILE 2007

Coastal DSS Sentinel District Information for Districts of Lindi, Mtwara, Pwani and Tanga Regions

Part 1: Introduction

The purpose of this document is to simplify, package, and communicate complex information on vital statistics and the local burden of disease in a practical, accessible format for district health planning. It is intended for use by Council Health Management Teams who serve several million people in rural districts of the coastal zone of Coast, Lindi, Mtwara and Tanga Regions and other parts of Tanzania having socio-economic, cultural, and ecologic circumstances broadly similar to those of the rural coast. This information should be considered as part of the situation analysis for the annual District Health Planning cycle. All information is provided in a graphical format with short explanatory captions and minimum text to provide "pictures" of the current demography and disease burden.

The data source is the Tanzania Ministry of Health and Social Welfare's National Sentinel Surveillance System (NSS). The specific data in this profile comes from the Coastal Sentinel Demographic Surveillance System located in Rufiji District for the data year 2006. This sentinel profile provides over 800 health and demographic statistics and is updated annually since 1999. In the year 2006, the Rufiji Demographic Surveillance System monitored a population recording 80,842 person-years lived in 17,287 households. This sample is very much larger than the DHS and other national household surveys. In the year 2006, the system documented 3,279 births and 924 deaths, including the causes, rates and trends of these deaths.

Health reforms in Tanzania expect Districts to go beyond just managing diseases, to managing health systems from a perspective of health equity. It is difficult for health systems to target the poor accurately. However in all societies, the poor carry the heaviest burden of disease and it is possible to target major components of the Burden of Disease (BOD), thus increasing equity in resource allocation with more emphasis on the poor. For districts, this means a greater focus on cost-effective interventions that address the largest shares of the burden of disease. In Africa, 78% of the burden¹ comes from premature mortality. The causes of this mortality also cause most of the disability that makes up the remaining 20%. Therefore we can use cause-specific mortality burden as a guide to setting priorities. Since most mortality occurs at home or outside of health facilities, we cannot rely entirely on health facility-based Health Management Information Systems' attendance data for information on the burden experienced by communities and households. Instead we can use household derived demographic surveillance data from the National Sentinel Surveillance System for understanding the current burden and its trends in various parts of the country.

In **Part 2** of this document we convert current remaining disease-specific mortality into *intervention targetable* shares of the total burden of disease and present this in a pictorial format as follows:

Distribution of the total household burden of disease by:

- Broad population groups (e.g. under-fives, adults, and women of child-bearing age);
- Broad causes (e.g. communicable, perinatal, maternal nutritional; non-communicable; and injury.);
- Cost-effective interventions available to CHMTs and rural district health services;
- Individual conditions addressed by cost-effective intervention strategies.

The above information is essential for identifying the most important health intervention priorities (as opposed to disease priorities) and in allocating appropriate and proportionate resources for the support of selected interventions at district level.

In **Part 3** we provide additional graphical information for planning the health system such as distribution of births and deaths by month and season, and by place of birth or death.

In **Part 4** we provide a demographic breakdown of the sentinel population structure by age, sex, current fertility and age specific mortality rates. These are applied to the current district populations to predict the numbers of births, infants, under-fives, pregnancies, and deaths to be expected at district level in the next planning year.

In **Part 5** we provide a one-page summary and conclusions, as well as contacts for further information on the NSS and the Rufiji (Coastal) DSS.

Part 2: Intervention targetable burden of disease

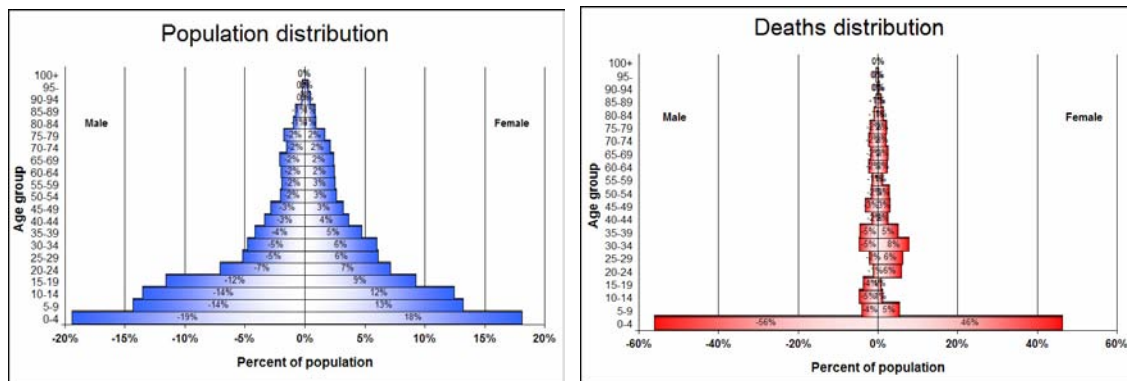


Figure 1. Age pattern of mortality risk in the sentinel district in 2006

Figure 1 compares the population structure of the sentinel district with the mortality structure. It shows that over half of the total population's mortality is experienced during the first five years of life. This is due to preventable neonatal conditions and childhood illnesses. A second preventable peak occurs in young adults and is largely due to the effects of HIV/AIDS, TB and maternal mortality. In high income countries the majority of deaths occur in old age. Here that pattern is reversed. There is also an imbalance of excess mortality in females in the age group 20 to 35 and this disparity is likely due to the effects of maternal mortality. See legends of Figures 12 and 25 for further interpretation of these graphs.

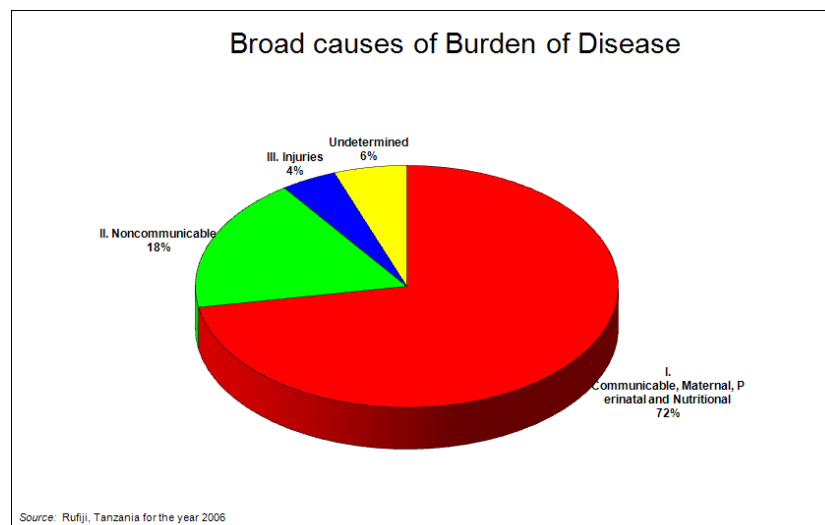


Figure 2. Broad Causes of the burden of disease in 2006

In Figure 2 above, the total burden of disease in the Coastal Sentinel is divided into three broad groups of causes. Group I (red) contains all communicable, maternal, perinatal and nutritional causes. In the Coastal Sentinel district, these account for 72% of the total burden. Group II (green) represents the non-communicable diseases and accounts for 18% of the total burden. Group III (blue) is all external causes such as injuries and contains about 4% of the burden. The remaining 6% of the burden is undetermined by available methods (yellow). This overall pattern indicates that the health transition towards non-communicable and life style diseases is not yet very advanced in coastal regions of Tanzania and that there is a large unfinished agenda of preventable conditions. The Coastal pattern is similar to the rest of sub-Saharan Africa, except that the proportion due to injuries is much less. This is due to the heavy burden of injury inflicted by war and civil conflict in several African countries, which do not occur in Tanzania.

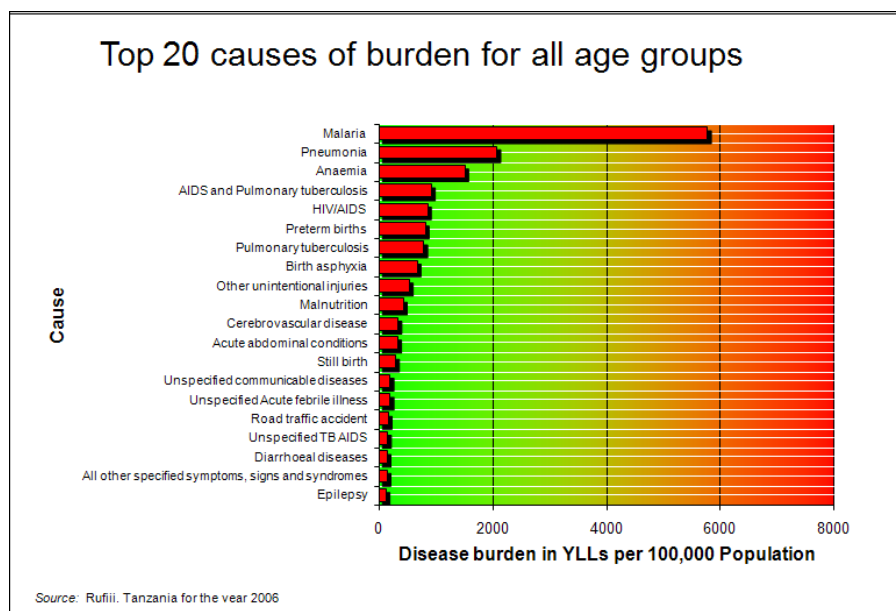


Figure 3. Top 20 causes of mortality burden across all ages

This graph displays the top 20 conditions contributing to the burden of disease in terms of years of life lost in 2006 in the sentinel population. Malaria, pneumonia, anemia and HIV/AIDS mortality and morbidity dominate, followed by a variety of neonatal and under-five problems such as low birth weight, birth injury and asphyxia. Aside from the HIV/AIDS components, many of the top causes occur in children under five. The main causes of the under five mortality are therefore shown below.

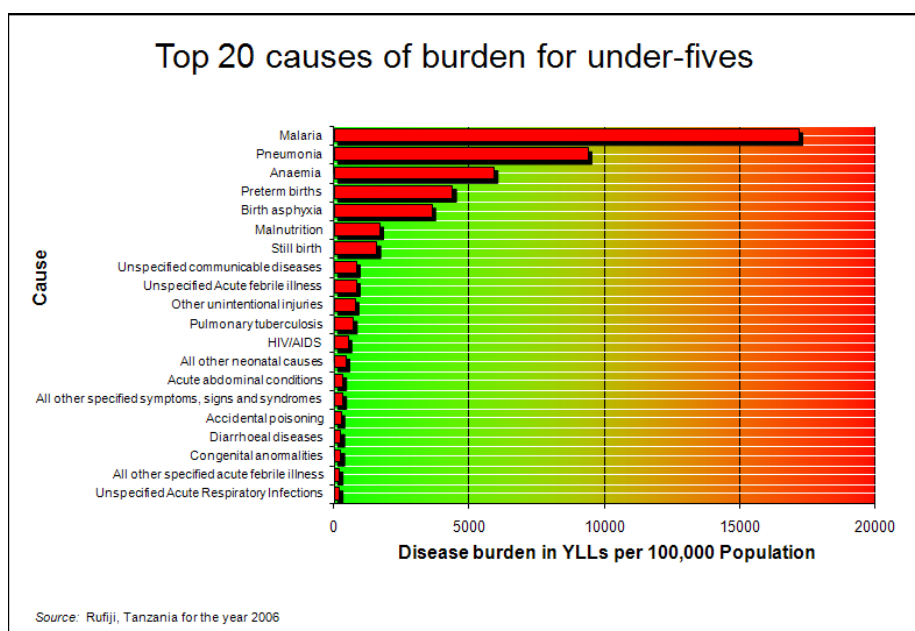


Figure 4. Top 20 causes of mortality burden in children under-five.

Given the high burden of preventable mortality in children under-five, we show here the proportions for the main causes of death across this age group. Malaria, pneumonia and anemia dominate, followed by conditions in the perinatal and neonatal period. Diarrhoea and measles are now well controlled and at relatively low proportion. Interventions for neonatal, child and maternal causes are critical to address this largely preventable burden. It is difficult to plan health services from a disease by disease perspective. Strategies and packages that integrate across causes and age groups are more effective to manage and prioritize. This profile focuses on such intervention strategies rather than individual diseases.

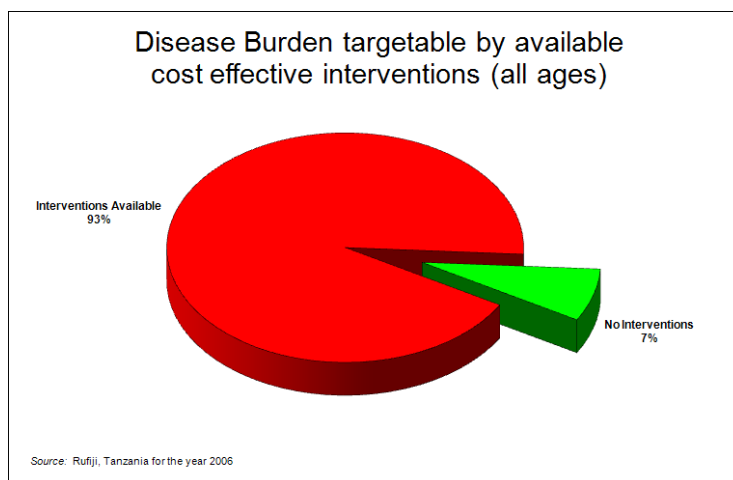


Figure 5. District disease burden targetable by available cost-effective interventions

Although it is not possible to prevent all premature mortality, the above graph shows the good news that 93% of the remaining disease burden by 2006 is amenable to health care and targetable by cost-effective interventions available through Comprehensive Council Health Plans. As new cost-effective interventions become available for the non-addressed 7% of the burden, these can eventually be considered for inclusion in the National Package of Essential Health Interventions for rural districts.

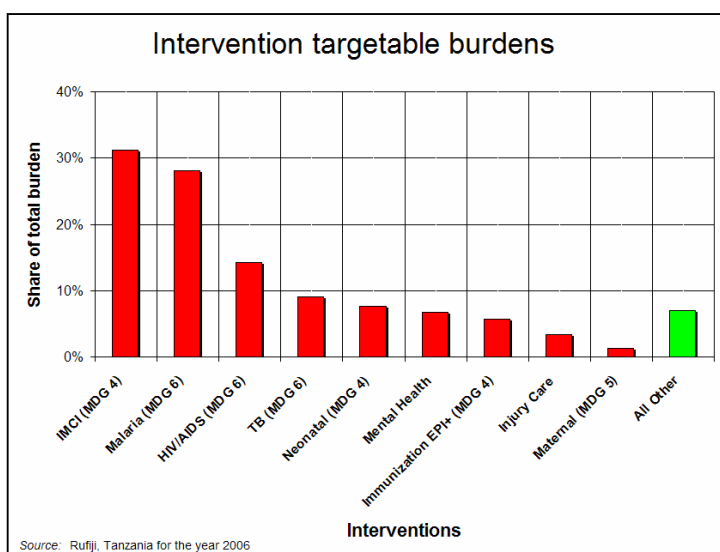


Figure 6. Intervention targetable shares of the burden of disease

The above graph shows how much of the total burden of disease is targetable by each individual cost-effective essential health intervention strategy currently available at District level. This core package includes eight groups of interventions and strategies. Together these represent a minimum package and include: Integrated Management of Childhood Illnesses (**IMCI**); Malaria case management with artemisinin combination therapy (**ACT**) plus insecticide treated nets (**ITNs**) and/or indoor residual spraying (**IRS**) and intermittent preventive therapy (**IPTp**) for prevention of malaria; HIV/AIDS by antiretroviral therapy (**ART**), voluntary counseling and testing (**VCT**), prevention of mother-to-child transmission (**PMTCT**), **STD syndromic management** and Integrated Management of Adolescent and Adult Illness (**IMAI**); **TB DOTS**; New intervention strategies for neonatal mortality; Immunization (**EPI+**); **Injury Care**; and Safe Motherhood Initiatives (**SMI**) for maternal mortality. Seven of these eight groups directly address Millennium Development Goals for health (MDG4 Child Mortality; MDG5 Maternal Mortality; MDG6 HIV/AIDS, TB and Malaria). We also include the largest non-fatal share of the burden (mental health) which requires attention. Since some diseases are addressed by more than one intervention package, these shares add to more than 100%. The category labeled *All Other* (7%) is all remaining disease burden not yet targetable by any of the listed cost-effective essential health interventions (see below). Each of these bars is examined in detail in the following graphs.

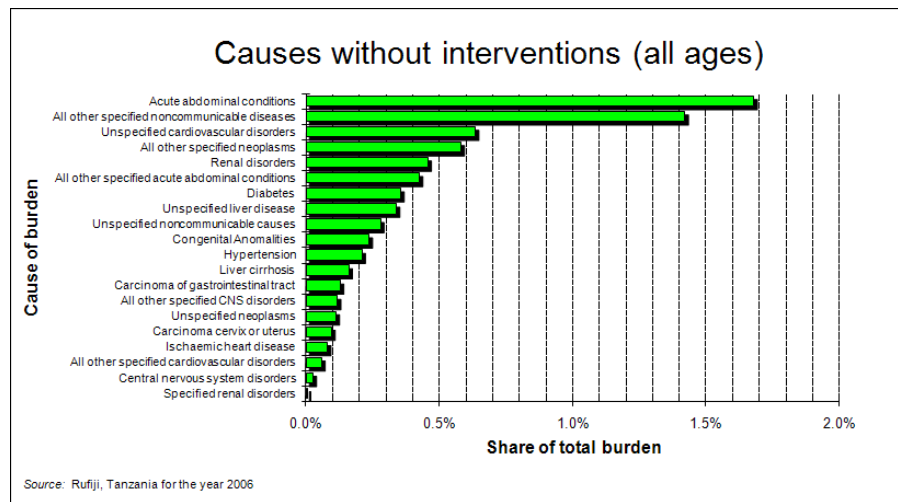


Figure 7. Causes without cost-effective district intervention

There are 20 causes of death that make up the 7% share that is currently not yet targetable by cost-effective essential health interventions at rural level. Most of these causes individually constitute less than 1% of the total burden of disease in the population and will be difficult to be addressed cost-effectively without high opportunity costs.

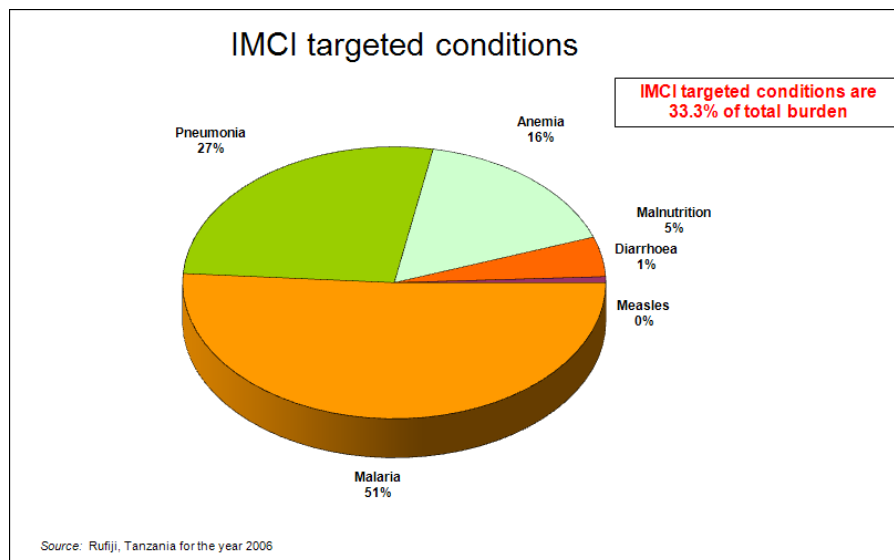


Figure 8. Integrated Management of Childhood Illness (IMCI) targetable conditions

Children under the age of five carry the highest per capita share of the total burden. The above graph shows that if **Integrated Management of Childhood Illness (IMCI)**, an integrated, cost-effective essential health strategy targeted to under-fives, was the only intervention offered, it would address one third of the total population burden of disease. No other single intervention addresses such a large portion of the remaining burden of disease, thus this package merits intensive support to reach high levels of coverage. Strengthening this package with more interventions for neonatal mortality in the first month of life (IMNCI) would increase its importance even further. The total share of the burden targetable by IMCI has decreased from 41.3% in 1999 to 33.3% in 2006, possibly as a response to the wide access to IMCI that was achieved since 1999 in Rufiji District. Similar gains might be expected in other districts achieving similar coverage through use of Council Health Basket Funding as done in Rufiji. The above graph illustrates the relative contribution of the individual component conditions addressed by IMCI. Acute febrile illness including malaria constitutes about 51% of the under-five burden and emphasizes the importance of providing efficacious preventive and curative interventions for malaria. The transition from chloroquine to SP and now ACT improves the effectiveness of IMCI.

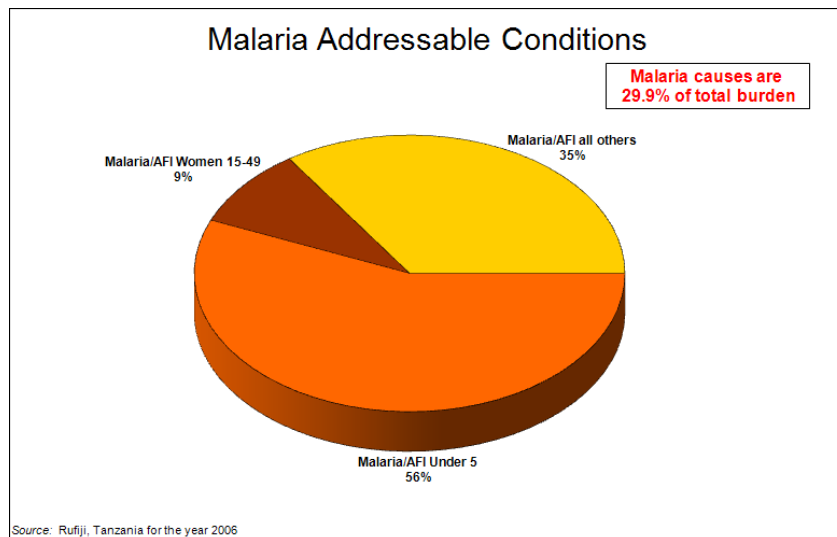


Figure 9. Malaria and Acute Febrile Illness Targetable Conditions

About 30% of the total burden of disease of the population is driven by acute febrile illness, predominantly malaria (down from 37% in 1999). Of this, about 56% is suffered by children under-five (also counted in IMCI). The other important risk group is pregnant women as malaria risk increases during pregnancy. This illustrates the importance of prompt and effective **Malaria Case Management with ACT** according to the new National Guidelines, and preventive interventions such as **Insecticide Treated Nets (ITNs)**, especially for mothers and young children via the Tanzania National Voucher Scheme, and **Intermittent Preventive Treatment (IPTp)** with SP at antenatal care during pregnancy.

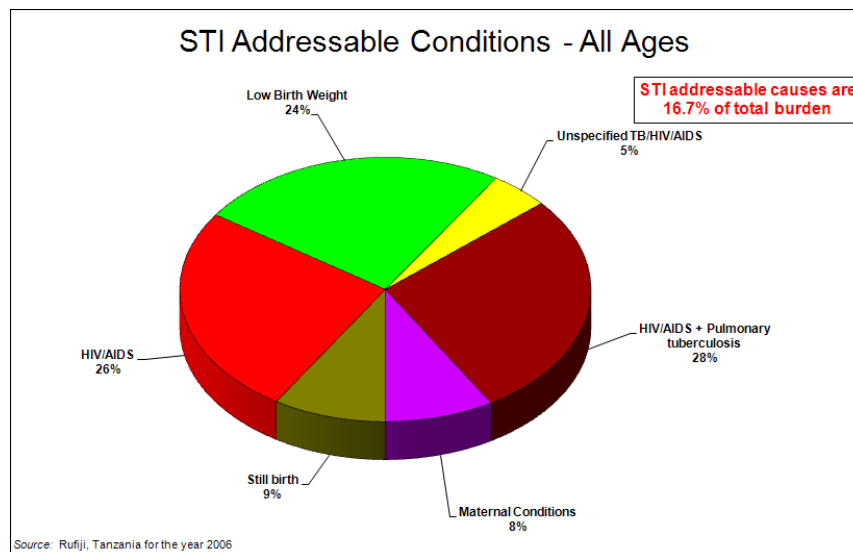


Figure 10. HIV/AIDS & STI targetable conditions

Sexually Transmitted Infections (STIs), including HIV/AIDS, constitute about 16.7% of the total disease burden in 2006 (up from 14% in 1999). They are the third largest targetable component of the burden of disease. HIV/AIDS is the largest component of the mortality, either directly or indirectly through increasing the risk of TB. Other major contributors are stillbirths (mainly associated with syphilis), low birth weight, and maternal conditions (possibly associated with Chlamydia and gonorrhea). STIs can be partially addressed by carefully selected **Reproductive Health and Integrated Management of Adolescent and Adult Illness (IMAI)** interventions such as **Antiretroviral Therapy (ART)**, **Prevention of Mother-to-Child Transmission of HIV (PMTCT)**, **Voluntary Testing and Counseling (VCT)**, **Condom Promotion**, **STD Syndromic Management**, **RPR Screening in Pregnancy**, **Family Planning**, **Strengthening Blood Transfusion Safety**, **School Health and Youth Interventions**, **Safe Motherhood Initiatives**, etc.

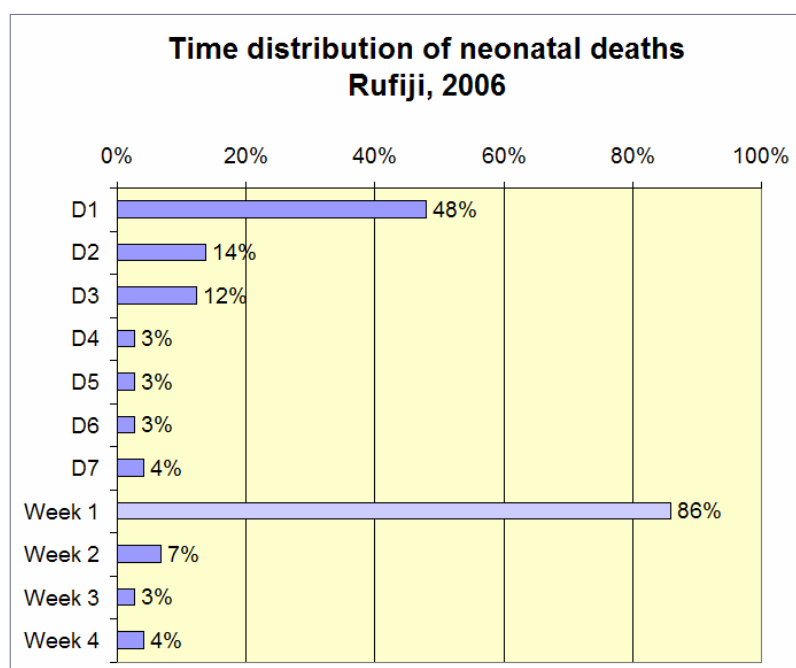
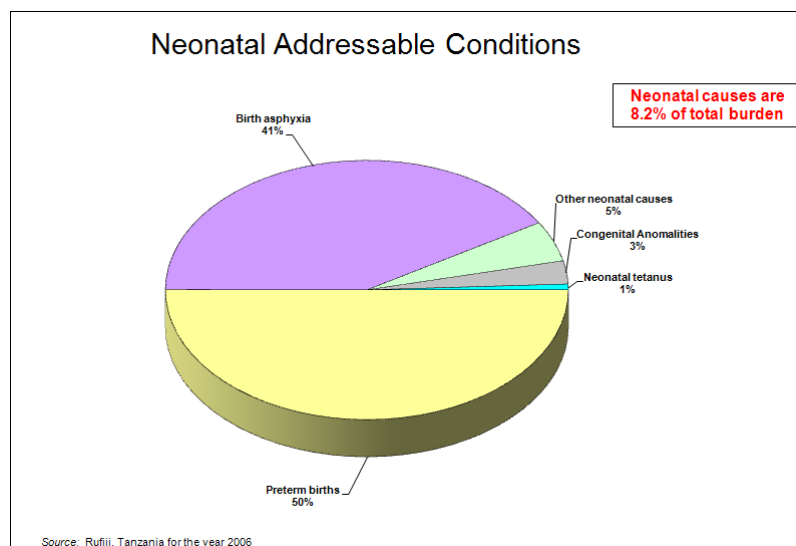


Figure 11. Neonatal mortality targetable conditions

The above graph shows the proportional neonatal mortality burden (deaths in the first 28 days of life) is 8.2% of the total mortality burden. This neonatal proportion is increasing as post-neonatal mortality declines. There has been little progress in reducing neonatal mortality in the sentinel district and in Tanzania as a whole. We therefore draw additional attention to this since it may retard the pace at which Tanzania can achieve MDG-4. Preterm births or low birth weight constitute the largest share of neonatal mortality in the sentinel district, followed by birth injury or asphyxia, and congenital abnormalities. Neonatal tetanus has re-appeared after an absence of several years suggesting that **EPI** coverage may need to be examined. Birth injury & asphyxia demands more attention to **quality obstetrical care**. Low birth weight demands further attention on both **maternal nutrition** and on **malaria prevention in pregnancy (IPTp, ITNs)**. The second graph shows that almost half of the neonatal deaths occur in the first day of life. **Most neonatal deaths occur between delivery and 7 days of life**. These graphs illustrate the growing importance for dealing with neonatal mortality now that IMCI has made such good progress in reducing post-neonatal under-five mortality.

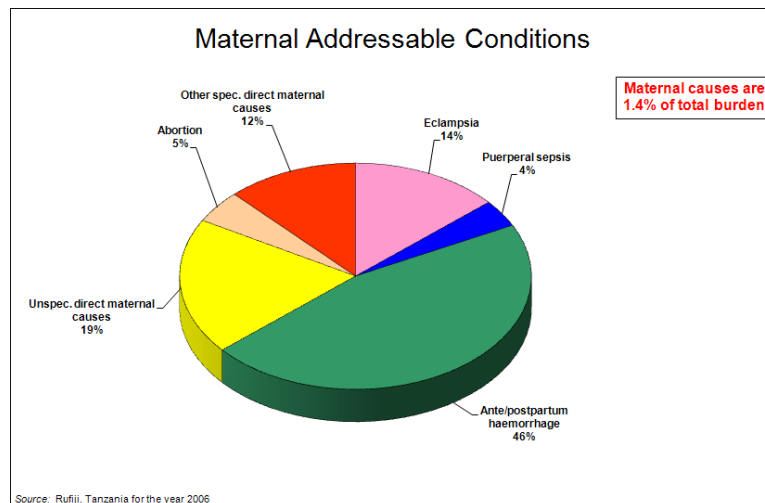


Figure 12. Maternal mortality targetable conditions

Although the relative burden of maternal mortality appears comparatively low, it must be appreciated that this is concentrated in the population who are female between the ages of 15 and 45. The imperative of maternal mortality deserves higher priority than this burden share suggests. **Major causes of maternal death in the sentinel are haemorrhage and hypertensive disorders**; but also sepsis, and obstructed labour. Malaria, anemia and HIV/AIDS are also important indirect causes of this burden. The high rate of eclampsia draws attention to the need for training and **managing hypertensive disorders of pregnancy** (e.g. with magnesium sulphate). High rates of haemorrhage, birth injury and sepsis can be addressed by a priority package for **Emergency Obstetric Care (EmOC)** and **Skilled Birth Attendance** including essential obstetric drugs (e.g. oxytocins), equipment (e.g. resuscitation), supplies (e.g. airway, bag and mask, and blood transfusion), post-abortion care, access, referral, quality assurance and training. Other key packages are: **Family Planning** (spacing, men as partners, youth friendly services, prevention of unwanted pregnancies); and **Antenatal Care and Birth Preparedness** (ITNs, IPTp, nutrition, maternal anemia, STD syndromic management, and post delivery care).

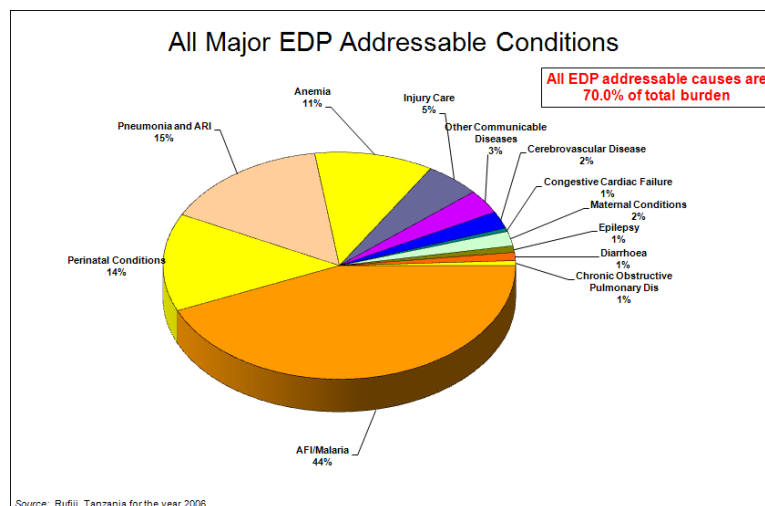


Figure 13. Essential Drug Program (EDP lists for kit or indent) targetable conditions

This graph illustrates the profound importance of maintaining adequate supplies of essential drugs. The EDP list for Tanzania has been well designed for the current burden of disease and addresses 70% of the total burden. Most essential drugs are delivered through essential health interventions already listed in this document, but some have no specific package such as diarrhoea, pneumonia and ARI in people over five years as well as a number of **neglected communicable and non-communicable diseases** such as **helminthic infections, epilepsy, hypertension and cardiovascular conditions**. These considerations are important to bear in mind for those districts converting to the Indent System for essential drugs.

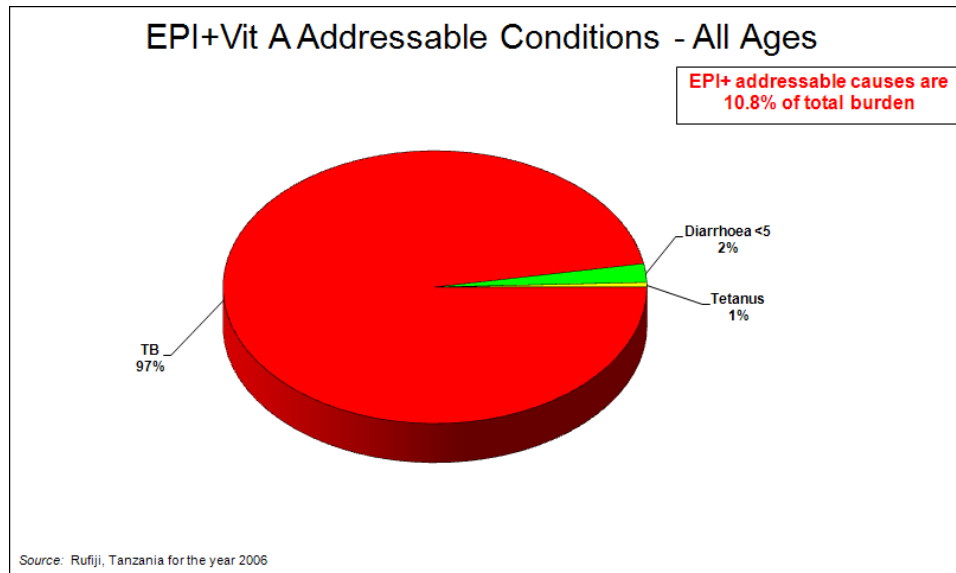


Figure 14. Expanded Program on Immunization Plus (EPI+) targetable conditions

The above graph illustrates the general success of **EPI+** as an essential health intervention against most of the antigens. The current high coverage of **EPI+** has reduced a previously high burden to 10.8% of the total burden. Remaining causes are tetanus which has re-emerged. TB is rising due to HIV. This illustrates the importance of maintaining **EPI+** at high coverage and supporting additional interventions for measles (e.g. **IMCI**), Tetanus (e.g. **SMI**), TB (e.g. **TB DOTS**) and **EPI+ with Vitamin A Supplementation** for diarrhoea and measles mortality reduction in under-fives.

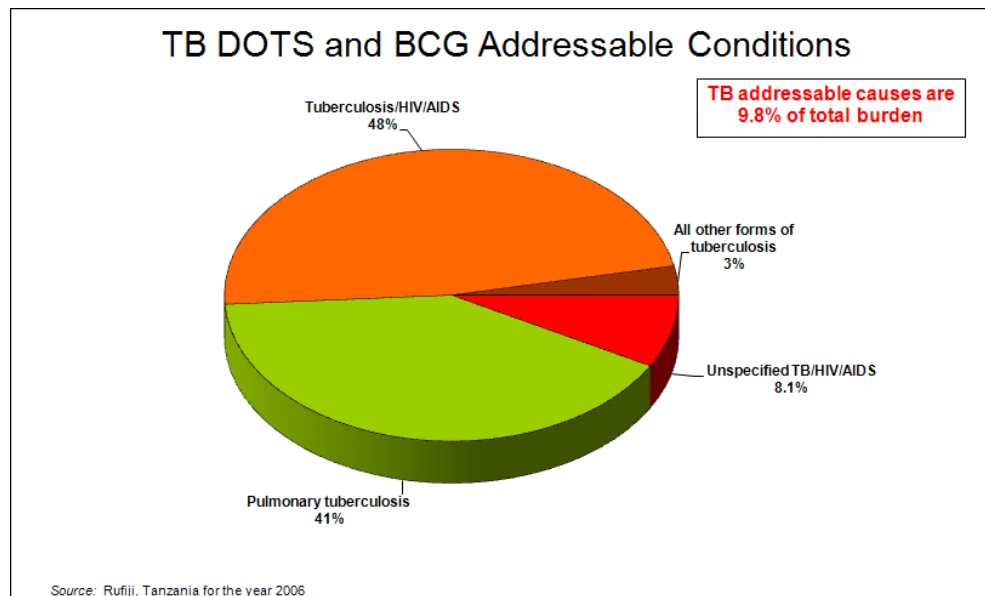


Figure 15. TB Directly Observed Treatment – Short Course (TB DOTS) targetable conditions

TB accounts for about 9.8% of the burden of disease in 2006, up from 5% in 1999. HIV increases the risk of TB mortality. This illustrates the importance of increasing the coverage and integration of **TB DOTS** and **STD Syndromic Management** as well as maintaining high **BCG** immunization coverage in newborns.

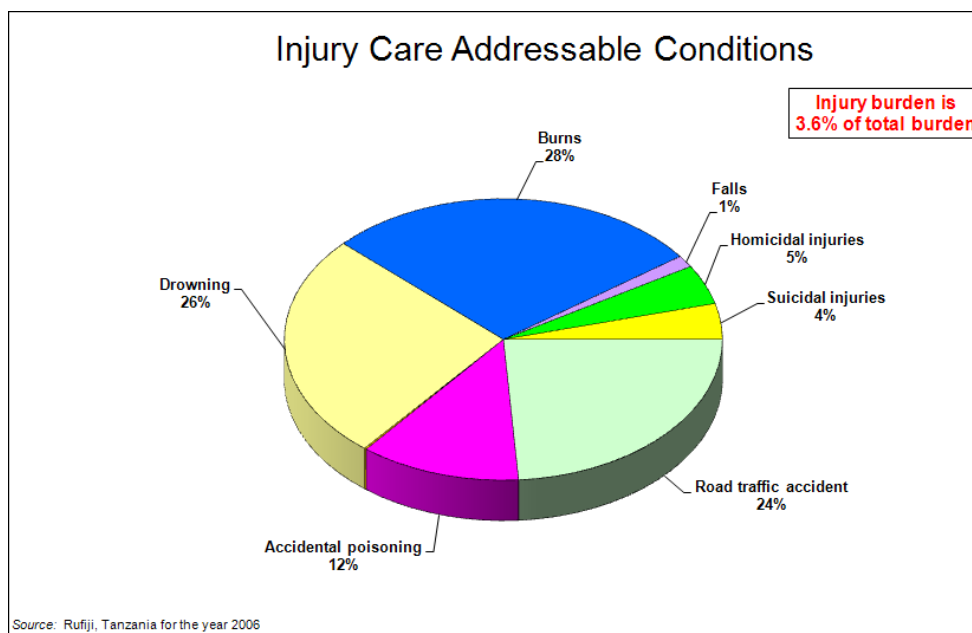


Figure 16. Injury care targetable conditions

The above graph illustrates the relatively low (3.6%) but important burden of disease that can be addressed through life-saving interventions for injuries through adequate risk avoidance and injury care. This shows the importance of maintaining a regular supply of **Essential Drug Kits** and other supplies that include materials for **Injury Care**. It also suggests the need for appropriate **Inter-sectoral Interventions**, e.g. to address the rising risk of road traffic accidents. The pattern of injuries will vary greatly between districts depending on the nature of roads, which affects road traffic accidents, and the proximity to wild life, which determines risk of animal attacks. Drowning is a common cause of fatal injury in the Coastal Sentinel. **School** Health Programs should consider rescue, first aid, and swimming instruction at primary school level. Unlike previous years there were no fatal animal or snakebite attacks in the DSS area. Nevertheless, adequate stocks of rabies vaccine and anti-venom should be kept available. In districts where suicide or homicide are occurring, health planners may need to consider mental health interventions.

Part 3: Other DSS data useful for planning purposes

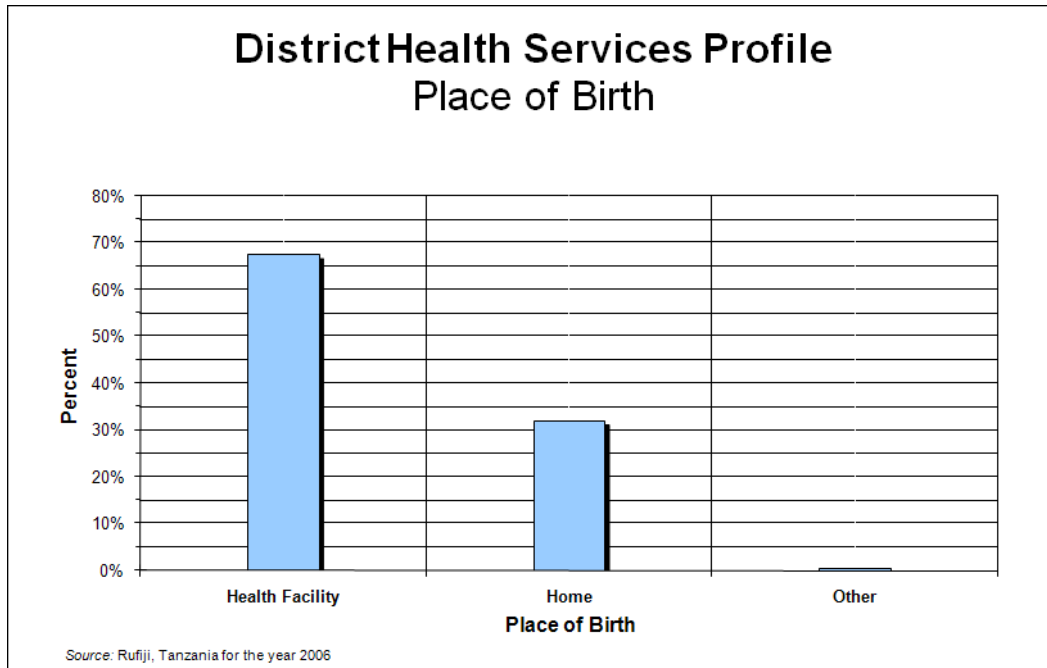


Figure 17. Place of Birth

The above figure illustrates that almost 70% of births now occur in health facilities and about one third at home. This rate of births in health facilities is higher than the national average of 47% for Tanzania recorded in the Tanzania DHS 2004.

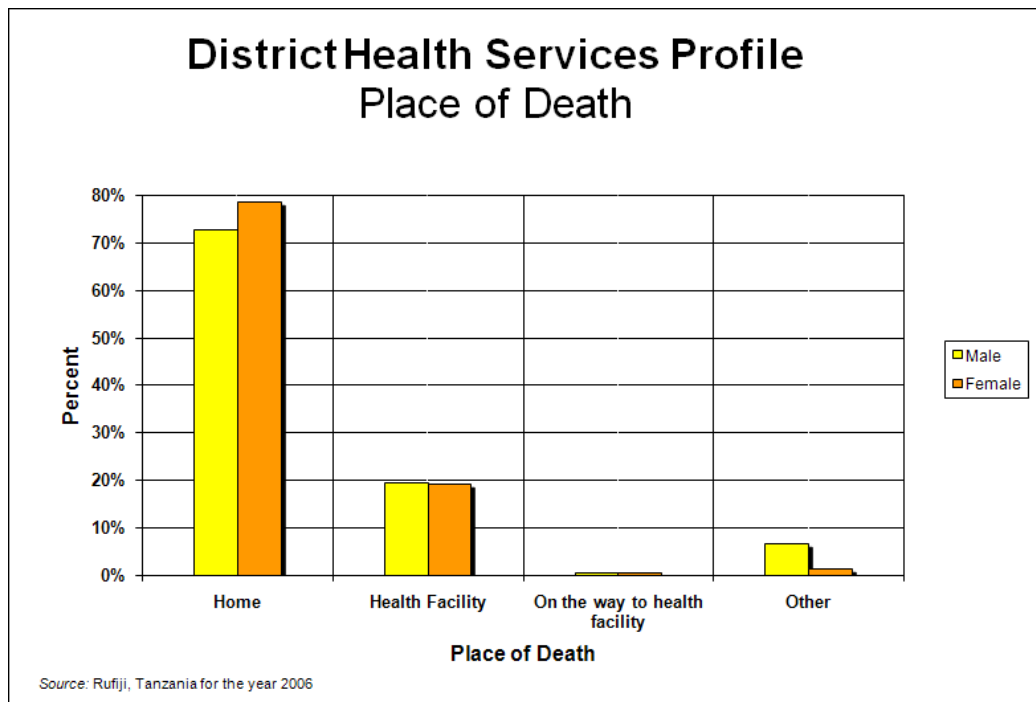


Figure 18. Place of Death

The above graph shows that over 70% of all deaths occur at home. This emphasizes the need to consider household-based data when assessing the burden of disease in the population, and not only HMIS health facility data. This rate has held constant over the past seven years of monitoring.

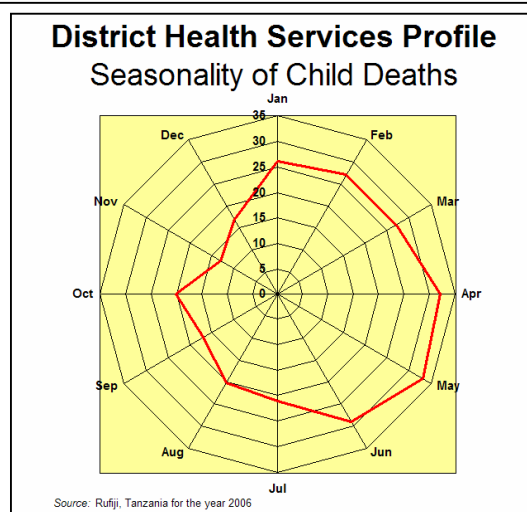
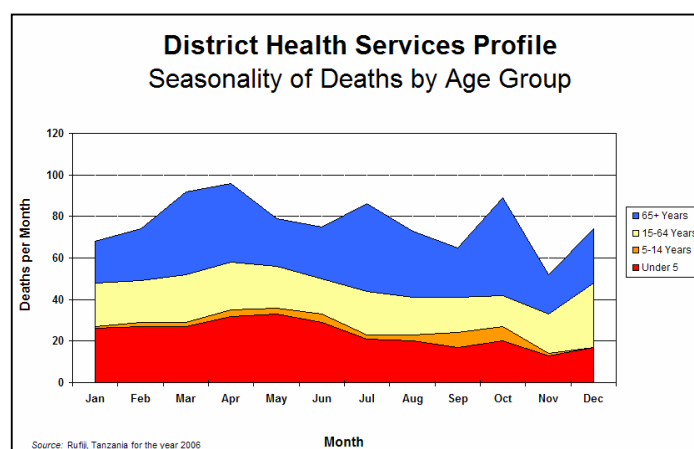
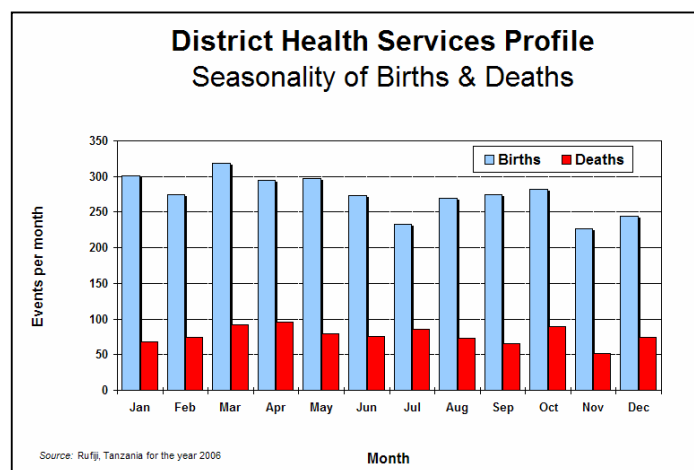


Figure 19. Seasonality of births and deaths

The top figure above shows monthly births and deaths in 2006 where the DSS area recorded an average of 274 births and 77 deaths per month. The second shows monthly deaths in children under 5 years; school aged children 5-14 years; adults 15-64 years; and the elderly 65 years of age and older. Mortality pattern in adults 65 years and above has an additional peak in July compared to other ages. The third figure shows mortality in children under five with peaks at the end of the rainy season in April and May. This general pattern is consistent with malaria as the single largest disease component contributing to the burden of disease in children, which also peaks during the rains.

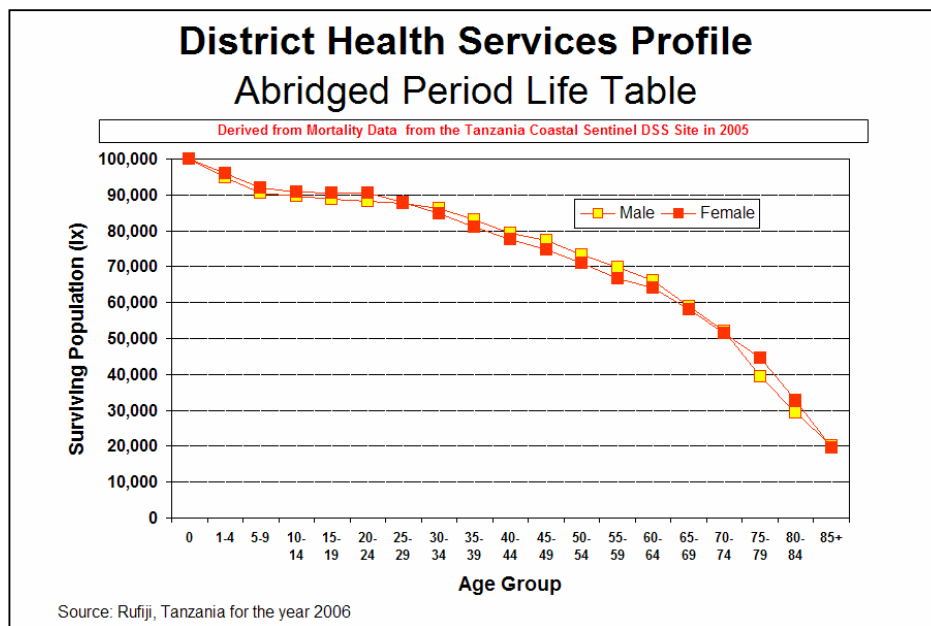


Figure 20. Abridged life table survival curve for males and females in 2006.

The above figure shows the survival of a hypothetical cohort of 100,000 males and 100,000 females, if born in 2006 and exposed to current risks of mortality in the sentinel area. Females have a biological survival advantage over males except for the period aged 20-49 when the risk of maternal mortality over-rides their biological advantage.

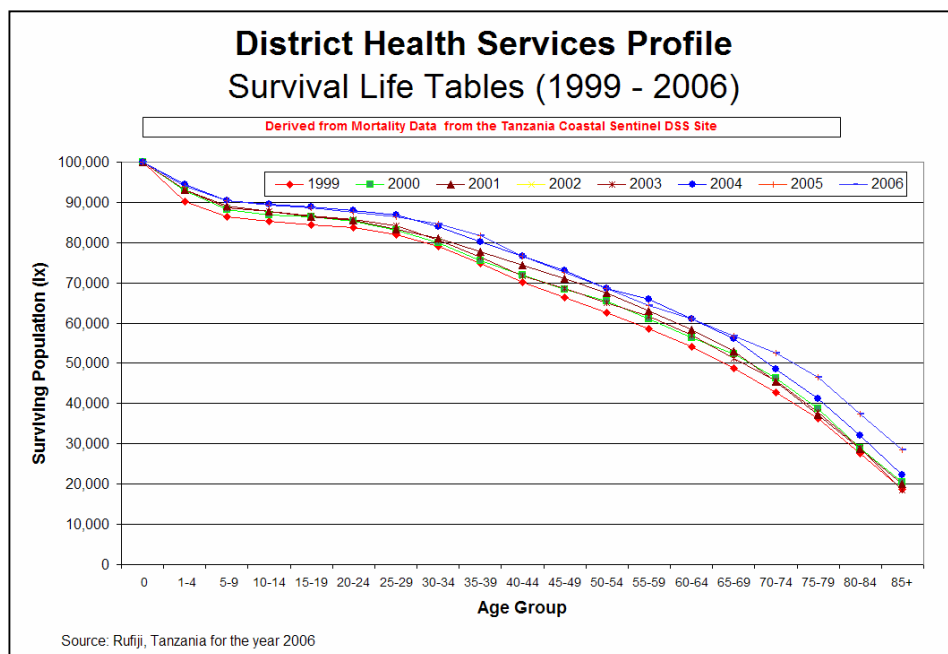


Figure 21. Abridged life table survival curves between 1999 and 2006

This figure shows the abridged total population life table (males and females combined) for each of the past eight years, showing a steady improvement in survival across all ages over this time period.

Part 4. Projecting DSS sentinel data to other districts

The information provided in Parts 2 and 3 can be used by Districts with socio-economic, epidemiologic, and health service profiles similar to Rufiji District. In Part 4, Sentinel District DSS rates are applied to the expected populations of Rufiji and other similar districts to derive district specific estimates in Coast, Lindi, Mtwara, and Tanga Regions. This section summarizes some key indicators generated by demographic surveillance that can be used for forecasting risk of particular disease burdens, or in need of particular interventions.

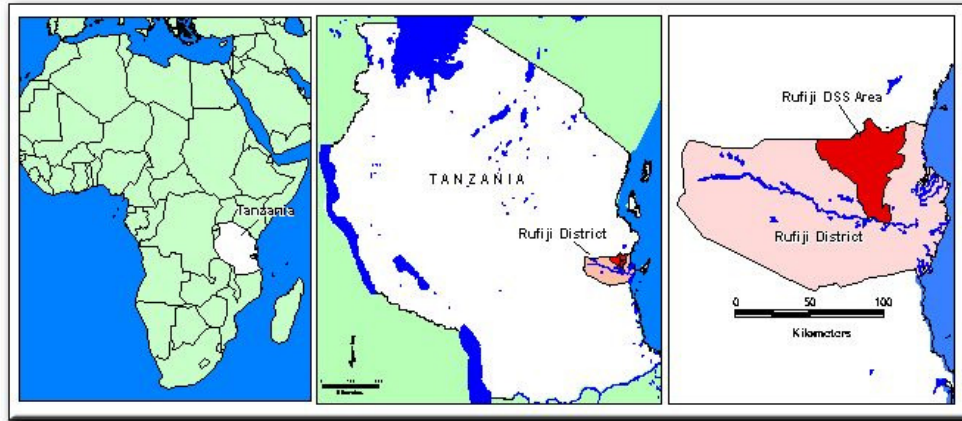


Figure 22. Map of location of the Rufiji DSS Sentinel Area.

The above map indicates the location of the area in which the Rufiji DSS operates. The entire population of 80,842 people in 17,287 households in this area is monitored continuously for births, deaths, in-migrations and out-migrations, with verbal autopsies on all deaths. This area is at the mid-point of the coastal border of Tanzania and is selected to be representative of rural coastal districts of the country. See also the figure, below.

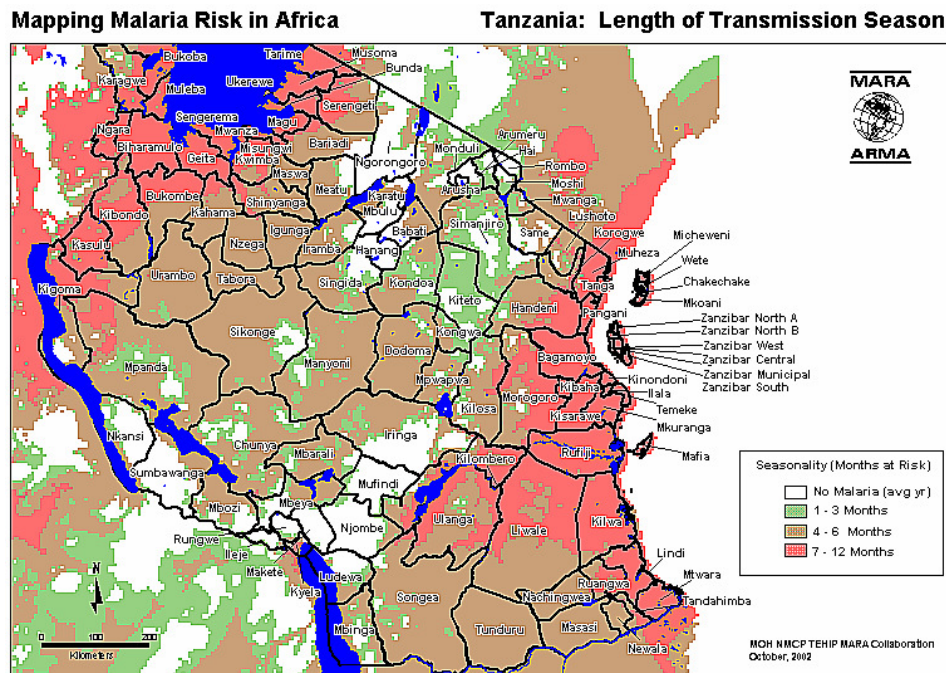


Figure 23. Map of malaria transmission risk in Tanzania

The above is a map of Tanzania showing the great similarity of Tanzanian rural coastal districts with respect to risk of malaria transmission. Malaria is the largest single disease component of the burden of disease in Tanzania and the Rufiji DSS sentinel data. This adds weight to the relevance of sharing Rufiji DSS data with other coastal districts.

Table 1. Trends in vital statistics in the Rufiji DSS Sentinel Area.

The table below compares a selection of demographic measures and trends obtained in the Rufiji DSS Coastal Sentinel area to those obtained in previous years in Rufiji and in the 2004 National DHS survey for rural mainland Tanzania. Note, the 2004 DHS gives average mortality estimates over the period 1999-2004).

Trends in Selected Rates and Statistics from the Tanzania NSS Coastal Sentinel DSS Area

Indicator	Units	National Tanzania DHS	Coastal DSS							
		1999-2004	1999	2000	2001	2002	2003	2004	2005	2006
Crude Birth Rate	Births per 1,000 population	42.4	42.3	41.6	41.3	39.9	39.2	36.3	41.3	40.6
Crude Death Rate	Deaths per 1,000 population	14*	15.4	13.3	12.8	13.1	10.5	11.6	10.4	11.4
Crude Rate of Annual Increase	Change per 100 population excluding migration	2.9%*	2.7%	2.8%	2.9%	2.7%	2.9%	2.5%	3.1%	2.9%
Still Birth Rate	Still births per 1000 live births	n/a	15.2	14.9	13.4	14.1	14.5	14.8	13.7	2.7
Infant Mortality	Probability of dying before 1st birthday/1000 (1q0)	68	107.8	75.6	69.0	69.3	46.3	54.5	45.8	0.0
Under Five Mortality	Probability of dying between birth and 5th birthday/1000 (5q0)	112	135.5	118.5	110.1	114.3	75.4	95.9	96.6	81.8
Adult Mortality	Probability of dying between age 15 and age 60/1000 (45q15)	n/a	312.6	297.4	282.3	289.6	257.4	263.5	280.3	0.0
Maternal Mortality Ratio	Maternal deaths per 1000 live births	5.8	5.2	5.7	2.5	5.1	3.5	2.1	4.6	4.6
Life Expectancy	Life expectancy at birth in years	51*	55.8	58.0	58.1	58.1	62.1	60.4	61.8	61.6
Total Fertility Rate	Children per woman 15-49 years old (avg)	5.7	6.2	6.2	6.1	5.8	5.8	5.6	6.3	6.3
Dependency Ratio	People <15 years or >64 years per 100 people 15 to 64 years	105	112	111	109	110	111	113	113	114
Average Household Size	People per household	4.8	4.8	4.9	4.2	4.7	4.7	4.7	4.7	4.8

Sources: Coastal DSS from Rufiji Demographic Surveillance System data for 1999 to 2005 (Part of the National Sentinel Surveillance System)

National Tanzania DHS is from National Bureau of Statistics (NBS)[Tanzania] and ORC Macro 2005. Tanzania Demographic and Health Survey, 2004-05. Dar es Salaam, for the period 1999-2004

*National level values from National Bureau of Statistics (NBS)[Tanzania] 2002 National Census

Table 2. Trends in mortality in the Rufiji DSS Sentinel Area.

There are many ways to express mortality indicators. Here we show a variety of measures. They are internally consistent with the fact that infant, under-five and adult mortality has declined in the Rufiji DSS area by about 54%, 39%, and 21% respectively since 1999. This indicates movement in the right direction despite the increasing prominence of HIV/AIDS and TB mortality in the District. The large drop in 2003 may have been assisted by the extremely low rainfall that year and as expected, rebounded slightly in 2004-6.

Infant Mortality in Rufiji District (excluding still births)

Measure	Definition / Units	(1998)	1999	2000	2001	2002	2003	2004	2005	2006	%Change
Probability	of infant death by age 1 (1q0) per 1000 children at birth	113.4	97.8	72.0	69.0	69.3	46.3	54.5	59.1	45.8	53.2%
Ratio	of infant deaths per 1000 live births	n/a	100.1	66.5	66.5	68.1	46.6	56.8	53.4	47.7	52.4%
Rate	of infant deaths per 1000 infant person years	n/a	107.8	75.6	72.2	72.7	47.7	56.9	61.5	46.9	56.5%

Source: Coastal (Rufiji) DSS except for 1998 from the TRCHS (DHS) of 1999.

Average decrease since 1999 54.0%

Under Five Mortality in Rufiji District (excluding still births)

Measure	Definition / Units	(1998)	1999	2000	2001	2002	2003	2004	2005	2006	%Change
Probability	of death by age five (5q0) per 1000 children at birth	166.8	135.5	118.5	110.1	114.3	75.4	95.9	96.6	81.8	39.6%
Ratio	of under five deaths per 1000 live births	n/a	131.5	102.6	102.6	108.3	74.0	98.0	87.2	85.6	34.9%
Rate	of under five deaths per 1000 under five person years	n/a	34.0	25.1	25.1	26.1	16.5	21.0	21.0	20.1	41.0%

Source: Coastal (Rufiji) DSS except for 1998 from the TRCHS (DHS) of 1999.

Average decrease since 1999 38.5%

Adult Mortality in Rufiji District

Measure	Definition / Units	(1998)	1999	2000	2001	2002	2003	2004	2005	2006	%Change
Probability	of death between age 15 and 60 (45q15) per 1000	n/a	312.6	297.4	282.3	289.6	257.4	263.5	280.3	246.7	21.1%

Source: Coastal Sentinel DSS (Rufiji)

Decrease since 1999 21.1%

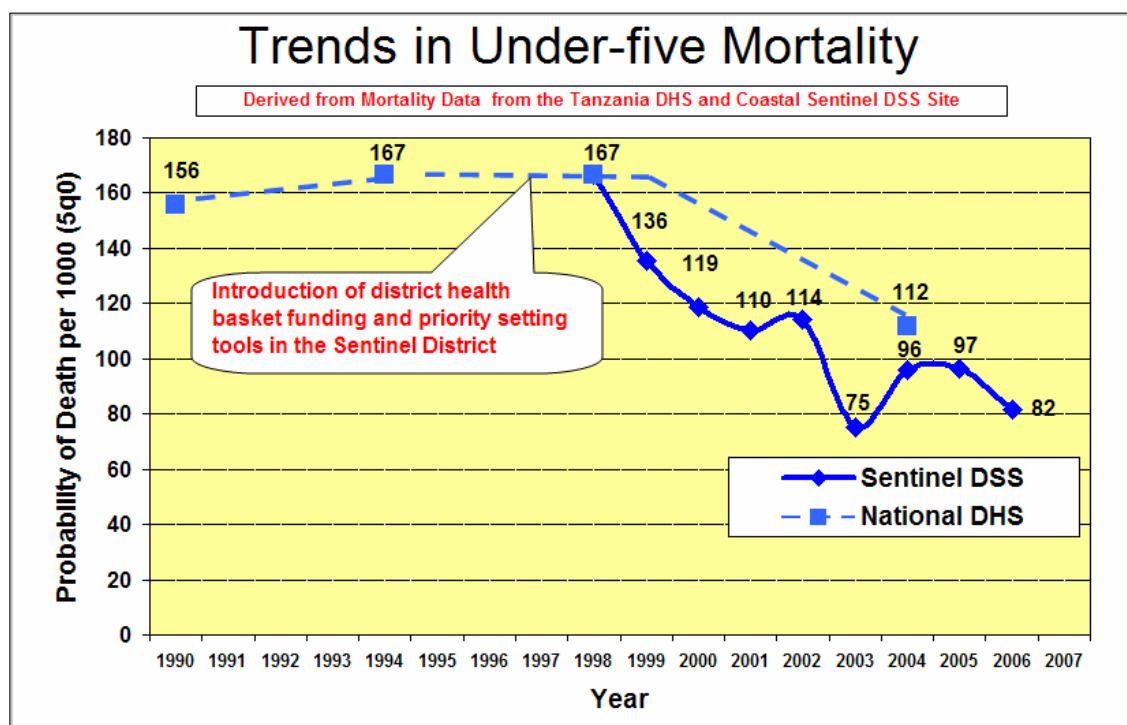


Figure 24. Long-term trend in child mortality in the Rufiji DSS Sentinel Area.

This figure shows the trend in mortality in this sentinel DSS area. The points between 1990 and 1998 are taken from the 1992, 1996 and 1999 DHS surveys for the rural coastal zone. The trend line and points from 1999 onward are from the Coastal Sentinel DSS in Rufiji District. Like many parts of Tanzania, mortality declines stagnated in the early 1990's. However, soon after the introduction of pilot **District Health Basket Funding** in 1997 in Rufiji (now available in all other districts), mortality began to decline again. At this rate of decline in Rufiji, the **Millennium Development Goals** for child mortality will likely be met ahead of schedule. In Rufiji, this has been achieved by using incremental basket funding for **scaling up coverage of essential health interventions and for health system strengthening**. This strengthening included access to these annual District Health Profiles for priority setting as well as the use of District Health Accounts tools for budget mapping in the planning cycle to align plans with priorities (now incorporated in Prime Ministers Office of Regional Administration and Local Government PlanRep Planning and Reporting Database for district budgets and expenditures). See: <http://www.poralg.go.tz/>

The question is often raised that because mortality is changing in the sentinel area, the profile may no longer have **relevance to other districts**. In response, it should be appreciated that the profile focuses on proportional mortality and not absolute mortality. Hence the relative priority of interventions changes very slowly even though mortality can drop quickly. The ranking of the top 10 interventions in 2005 is almost exactly the same as it was in 1999 before the mortality started to drop. The proportional burden targetable by IMCI (which has contributed much to the success in the mortality reduction) has decreased from 41% to 33%, but it is still the top ranked intervention. Malaria interventions have dropped in share from 37% to 30% but still remains in second rank. The only other intervention in the top ten that has changed place is that for HIV which has steadily moved higher in targetable burden shares. Hence the priorities as determined by this approach are broadly generalizable to other rural districts in coastal Tanzania. Recent evidence from the National DHS survey indicates substantial reductions in under-five and infant mortality are also occurring at national level since 1999, but were foreshadowed by these DSS findings.

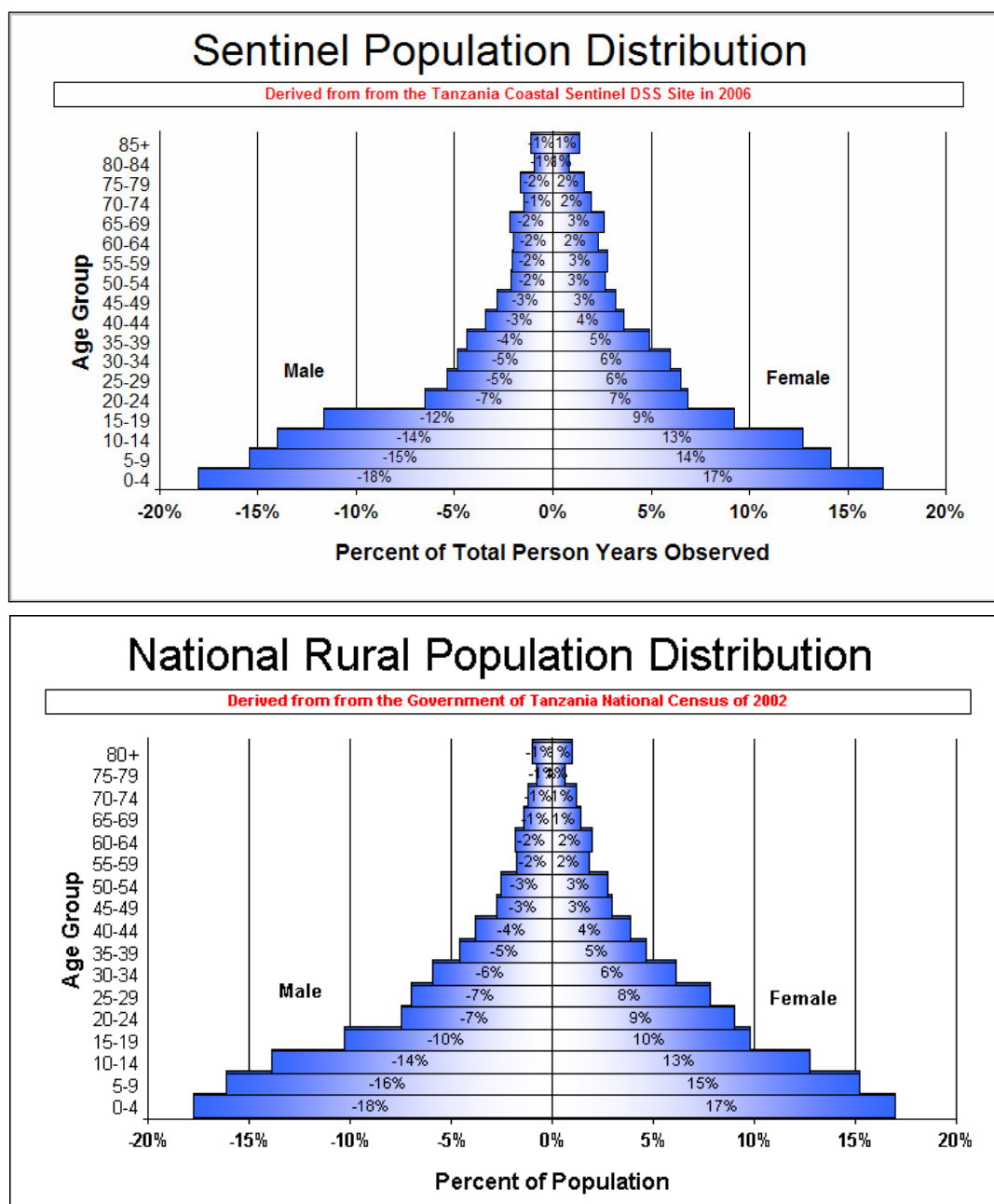


Figure 25. Population distribution by sex and age by 5 year age groups

The above graphs display the age and sex distribution of the sentinel population during the year 2006 in the Rufiji DSS area and the national rural population from the 2002 census. These graphs reflect the combined impact of births, deaths and migration over the past 100 years on the structure of the currently living population. The wide base of the pyramid is characteristic of a population with a combination of both high fertility and high child mortality. It indicates that the majority of the population is children, and that there is a high dependency of large numbers of children and, to a much lesser extent, the elderly on a relatively small adult population. Because of their large numbers, child and young adult health problems will continue to dominate the public health priorities of this area for many years to come. Most of the child mortality occurs in the first years of life. It can also be seen that the **Rufiji sentinel DSS population has similar structure to the rest of rural Tanzania.** Extrapolations from this structure can be used to estimate district-wide populations in different age groups in need of specific public health services. These are provided in Table 3 below.

Table 3. Projecting the Sentinel DSS rates to other rural coastal districts.

Demographic Projections for 2008 based on the Tanzania NSS Coastal DSS Sentinel for Other Rural Coastal Districts*

Indicator	Demographic Projections to Rural Coastal Districts (North to South)										
	Muheza	Pangani	Bagamoyo	Kibaha	Kisarawe	Mkuranga	Rufiji	Mafia	Kilwa	Lindi R	Mtwara R
District Population*	312,202	49,482	268,301	153,924	111,457	218,484	232,019	47,562	187,928	235,950	278,261
Projected Population of Infants	11,270	1,786	9,686	5,557	4,024	7,887	8,376	1,717	6,784	8,518	10,045
Projected Population 0-4 years (Children)	58,475	9,268	50,253	28,830	20,876	40,922	43,457	8,908	35,199	44,193	52,118
Projected Population 5-14 years (School Aged)	83,358	13,212	71,636	41,098	29,759	58,335	61,949	12,699	50,177	62,999	74,296
Projected Population 15-64 years (Adult)	144,831	22,955	124,465	71,405	51,705	101,355	107,634	22,064	87,180	109,457	129,085
Projected Population 65+ years (Elderly)	25,507	4,043	21,920	12,576	9,106	17,850	18,956	3,886	15,354	19,277	22,734
Projected Population Female 15-49 years (Maternal)	64,501	10,223	55,431	31,801	23,027	45,139	47,935	9,826	38,826	48,747	57,489
Projected Number of Births	12,675	2,009	10,893	6,249	4,525	8,870	9,420	1,931	7,630	9,580	11,297
Projected Number of Deaths	3,559	564	3,059	1,755	1,271	2,491	2,645	542	2,142	2,690	3,172
Projected Number of Under Five Deaths	957	152	822	472	342	669	711	146	576	723	853
Projected Number of Maternal Deaths	58	9	50	28	21	40	43	9	35	44	51

* Note: District Populations are projected to 2007 from the 2002 Tanzania Census (NBS) using regional inter-censal growth rates and the 2002 age structure. Mortality projections are based on the sentinel population mortality rates.

Part 5. Summary and conclusions

Selecting from the National Package of Essential Health Interventions. This health profile from a typical rural coastal district in Tanzania demonstrates the importance of investing in minimum essential health interventions and encouraging service use, especially for the poor. These include:

- **IMCI** (Integrated Management of Childhood Illnesses) and neonatal interventions for under fives;
- **Malaria Case Management** (using ACT) in the new National Guidelines;
- **IPTp** (Intermittent Preventive Therapy) for malaria control in pregnancy;
- **ITNs** (Insecticide Treated Nets) for malaria prevention for all, especially children and mothers;
- **IRS** (Indoor residual spraying, where appropriate on islands and epidemic or highly seasonal transmission settings);
- **ART, PMTCT and other HIV/AIDS and STI Control** (Antiretroviral Therapy; Prevention of Mother-to-Child Transmission of HIV; Voluntary testing and Counseling; Sexually Transmitted Infection Syndromic Management; condom promotion, strengthening Blood Transfusion Services, School Health Education and Youth; Interventions for in-school and out-of-school youths, Sex Worker Interventions, etc.);
- **SMI** (Safe Motherhood Initiative including ante and postnatal care, emergency obstetric care, IPT as above, delivery care, family planning, etc.)
- **EDP** (Essential Drugs Program) kits or Indent;
- **EPI Plus** (Expanded Program on Immunization with Vitamin A Supplementation);
- **TB DOTS** (Tuberculosis Directly Observed Therapy)
- **Injury Care** (Rule of Rescue, School Health Programs, etc.)

Disease elimination programs are also highly cost-effective, even though the remaining burden of disease may be too small to appear significant in a burden of disease approach. Where there are national programs for disease elimination (e.g. **lymphatic filariasis, onchocerciasis, polio, trachoma, iodine deficiency disorder**, etc) available in the district, these must be considered as essential health interventions and deserve high priority, along with the interventions listed above.

It must be stressed that the burden of disease reflected in this profile is the burden remaining in the face of the current health system and interventions at their current levels of coverage. Where coverage of preventive interventions is high (such as with EPI) the remaining burden is low. Such interventions must be maintained at high coverage. Where other intervention coverages are low, such as interventions for HIV/TB, the remaining burden is still high. This illustrates the importance of using any new funding (e.g. Council Health Basket Grants) for such purposes, rather than redirecting funding from previously successful preventive interventions.

Potential Gains. Collectively, these essential interventions will address about 93% of the total burden of disease of the population. If coverage of these eight strategies can approach 80% of those at risk, substantial reductions in the burden of disease can be expected. Conversely, investing in interventions that do not address these conditions, or investing in less cost-effective interventions that target these high-burden conditions, will have only marginal impact on the overall burden of disease and will dilute and distract human and fiscal resources from more cost-effective interventions. In most cases, this will also divert resources away from the interventions that primarily benefit the poor and neediest and towards those that primarily benefit the relatively better-off members of the community. In other words, such investment decisions will usually be inequitable as well as inefficient.

Recent Trends. In Rufiji District, coverage of EPI and IMCI is high, while coverage of ITNs is moderate but increasing. Health services are improving due to judicious use of health basket funding. Mortality in children is falling. Between 1999 and 2006 there was **a 39% reduction in all-cause under-five mortality and a 54% reduction in infant mortality**. Coverage of interventions for adults is unknown and is probably low for ART, PMTCT, STI Syndromic Management and TB DOTS. The burden of disease from HIV and TB is increasing. This has retarded some of the health gains; nevertheless, the net effect of improved services is that **adult mortality has declined 21%** over the past seven years. The overall burden of disease for the whole population has declined by about 31% (from 333 YLLs per 1000 person years observed in 1999 to 228 YLLs per 1000 person years observed in 2006). As a consequence, life expectancy is increasing (53.0 years in 1999; 61.6 years in 2006). It should be noted that although child mortality is declining, it is still unacceptably high and it is 20 times higher than maternal mortality, even though maternal mortality is also unacceptably high. It is increasingly likely that the decline in mortality is due to health system interventions although it may also be due to the variation in mortality risks moderated by climate, food security, or other socio-economic determinants. These figures will be compared with other DSS sites, and will be followed annually over time to build up a stronger picture of trends. The above observations point to the growing importance of including estimates of intervention coverage in the HMIS data set. Such information should prove an invaluable addition to burden of disease information in guiding the investment efforts necessary to extend the reach and access of essential health interventions to those in greatest need.

Part 6: Links for Further Information

For further information on this District Health Profile, contact:

IFAKARA HEALTH INSTITUTE (IHI)
Box 78373
Dar es Salaam, Tanzania
Tel: +255 22 277 1714
Eml: hmasanja@ihrc.or.tz
Attn: Dr. Honorati Masanja

For further information on the use of DSS mortality data for other districts in the National Sentinel Surveillance System (NSS), contact:

HEALTH MANAGEMENT INFORMATION SYSTEM
Department of Policy and Planning
Ministry of Health and Social Welfare
Box 9083
Dar es Salaam, Tanzania
Tel: +255 22 216 0261

For further information on the Rufiji Demographic Surveillance System regarding characteristics of the population monitored, the methods used, and the basic outputs see:

Mwageni, E., Momburi, D., Juma, Z., Irema, M., and Masanja, H. et al. (2002). **The Rufiji Demographic Surveillance System**. In: *INDEPTH Monograph Series: Population and Health in Developing Countries, Volume 1: Population, Health and Survival at INDEPTH Sites*. International Development Research Centre, Ottawa, Canada.

Or contact:

RUFJI DEMOGRAPHIC SURVEILLANCE SYSTEM
Station Manager
Box 40
Ikuriri, Rufiji District, Tanzania
Tel: +255 023 999 (ask for 31)
Eml: hmasanja@ihrc.or.tz
Attn: Dr. Honorati Masanja

End Notes:

¹ Since premature mortality represents about 78% of the expected burden of disease in Tanzania as estimated by the WHO Global Burden of Disease estimates of Tanzania's Disability Adjusted Life Year (DALY), the District Health Profile uses the mortality portion of the DALY (future years of life lost due to mortality or YLLs) as a proxy measure of the distribution of the burden of disease. All graphics showing the shares of the burden of disease are based on YLLs. These YLLs use standard DALY age weighting and discounting (3%). Cause specific mortality and associated YLLs are generated through longitudinal demographic surveillance in Rufiji District using the HRS Household Registration System and the NSS/AMMP verbal autopsy classification.

² The next annual Coastal Health Services Profile for the year 2008 will be available by June 2008. The Rufiji DSS is a member of the **INDEPTH Network of Demographic Surveillance Systems**. As of March 2004, management of the Rufiji DSS has been transferred by the Ministry of Health and Social Welfare from TEHIP to the Ifakara Health Research and Development Centre (now the Ifakara Health Institute).

³ The Rufiji DSS was established by the Tanzania Essential Health Interventions Project (TEHIP) by grants from the International Development Research Centre, Canada and DFID, UK. The RDSS is now managed by Ifakara Health Research and Development Centre (IHRDC) and is funded in part by the Ministry of Health and Social Welfare, Government of the United Republic of Tanzania, European Union, Comic Relief, UK, US Centres for Disease Control, and the INDEPTH Network.

Visit: www.ihrc.org for the Ifakara Health Research and Development Centre
Visit: www.indepth-network.net for the INDEPTH Network
Visit: <http://www.poralg.go.tz/> for the Government of Tanzania Planning & Reporting Database (PlanRep)
Visit: www.idrc.ca/tehip for the Tanzania Essential Health Interventions Project
Visit: http://web.idrc.ca/en/ev-64454-201-1-DO_TOPIC.html to view a short video on the Rufiji DSS site.

⁴ **Poverty Monitoring.** The Demographic Surveillance Systems in Tanzania can also report all indicators disaggregated by socio-economic status in order to determine both access to health services, and health outcomes of the poorest quintile in comparison to the rest of the population. Such results are specific to the setting in which they are collected and are therefore not included in this profile. Contact IHRDC for specific reports on health inequalities as determined by DSS.